

Carbon Cycle Activity

Overview: This activity is designed to help students discover the complexity of the carbon cycle. By the end of this activity students will have discovered that carbon can take many different forms, there is no set pathway that all carbon follows and that carbon is essential for life on Earth.

Materials:

- 8 Site Cards
- 8 Dice
- Plant Cards
- Animal Cards
- Ocean Cards
- Litter and Waste Cards
- Scratch paper
- Carbon Cycle Model Sheet

Instructions:

1. Students go through this activity on their own. There are no pairs or small groups for this activity. Each student should generate their own unique list.
2. Students begin at any site they chose. Students generate a numbered list on a piece of scratch paper; #1 on the list is the site they choose to begin with.
3. Students roll the dice at the site and follow the directions given on the dice. If they get “Stay Put” they should put a tick mark by the site listed on #1 and roll again. They do this until they get a roll that has them move to another site or pick a card which will give them further instructions. When they get a roll of the dice that has them move to a different site then they add #2 to their list and write down the site they go to next.
4. Students repeat the process by rolling the dice at each site they are sent to, following the directions they get when they roll and adding either a tick mark (if they are to “Stay Put”) or another number on their list as they move to another site.
5. If at any time a students returns to a site he/she has previously been they continue by adding that site visit to their list as a NEW number.
6. Continue going through the process for 10 - 15 minutes whatever is best for the students in your class.
7. Students use the list they generate to create a model of the cycle they went through as an atom of carbon. Use the “Modeling Instructions” sheet for further instructions.

The activity was a adapted from an accumulation of other games and activities listed below:

Carbon Cycle Role Play - California Academy of Sciences

Carbon Adventures: A game to teach the carbon cycle - GK12

Rock Cycle Game - Jordan School District

Water



Description:

Carbon dioxide dissolves in water and allows water plants to perform photosynthesis. Carbon in water also helps certain animals to make their skeletons and shells.

Atmosphere



Description:

Carbon, in the form of carbon dioxide and methane gases surround our planet. These are greenhouse gases that help to maintain the temperature of the planet.

Sediments & Rocks



Description:

Carbon is found in sediments and rocks made from the bones of dead animals or plants and discarded shells.

Vegetation



Description:

Plants use carbon dioxide to perform photosynthesis. Land plants take CO_2 from the air and aquatic plants take CO_2 from the water. Carbon is used to build plant tissue and starches.

Animals



Description:

Carbon is a building block of an animal's body. It is a key ingredient in the formation of skeletons and shells. The carbon in sugar found in the food animals eat is used in cellular respiration providing energy for the animal.

Decomposers



Description:

Organisms that break down dead plant and animal matter as well as their wastes returning nutrients including carbon back to the environment.

Fossil Fuels



Description:

Carbon rich deposits that formed through geologic processes acting on dead animal and plant remains. The process took thousands of years, the deposits are non-renewable.

Litter & Waste



Description:

Any discarded or dropped remains is considered litter and/or waste. Carbon rich items discarded such as leaves dropped in the fall or dung left behind by an animal etc. can be recycled naturally by organisms known as decomposers.

You are found in the nectar in a flower that is eaten by an insect.

Go to ANIMAL

You are in the leaf of a milkweed plant. A caterpillar feeds off you.

Go to ANIMAL

You are part of a nut that is gathered and eaten by a squirrel.

Go to ANIMAL

You are in the chlorophyll pigment of a leaf that is no longer needed and falls to the earth in the fall.

Go to LITTER & WASTE

You make up the cellulose in the grass of a meadow that is eaten by a herd of grazing Muskox.

Go to ANIMAL

You are part of the phylum in a discarded stock of wheat left behind in the field after harvest.

Go to LITTER & WASTE

You are part of the glucose found in a peach. A bird pecks and eats you.

Go to ANIMAL

You are phytoplankton found in the ocean, scooped up by a passing whale.

Go to ANIMAL

Vegetation

Vegetation

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Vegetation

<p><i>You are cellulose in the blade of kelp in the ocean. You are nibbled on by crab and moonfish.</i></p> <p><i>Go to ANIMAL</i></p>	<p><i>You make up the core of an acorn. You dropped to the ground but never grew.</i></p> <p><i>Go to LITTER & WASTE</i></p>
<p><i>You are part of the leaf of a water lily. A beaver makes you his lunch.</i></p> <p><i>Go to ANIMAL</i></p>	<p><i>You are the starch in a sunflower seed that fell to the ground but never grew.</i></p> <p><i>Go to LITTER & WASTE</i></p>
<p><i>You are part of the glucose in an apple that was overlooked at harvest. You fell to the ground.</i></p> <p><i>Go to LITTER & WASTE</i></p>	<p><i>You are part of the trunk of a tree that is cut down. You are burned as firewood.</i></p> <p><i>Go to the ATMOSPHERE</i></p>
<p><i>You are the starch in a potato that dropped off the harvest truck back into the dirt.</i></p> <p><i>Go to LITTER & WASTE</i></p>	<p><i>You are in the form of sugar given off by the roots of a plant to feed bacteria and fungi.</i></p> <p><i>Go to DECOMPOSERS</i></p>

Vegetation

Vegetation

Vegetation

Vegetation

Vegetation

Vegetation

Vegetation

Vegetation

<p><i>You are part of plant material that cannot be digested by the animal, you are eliminated.</i></p> <p><i>Go to LITTER & WASTE</i></p>	<p><i>You are in the bones of a marine animal that dies, settles on the seafloor & over time becomes a rock.</i></p> <p><i>Go to SEDIMENTS & ROCKS</i></p>
<p><i>You are part of a rabbits muscle. You are hunted and eaten for dinner by a coyote and her pups.</i></p> <p><i>Go to ANIMAL</i></p>	<p><i>You are part of the shell a crab shed as it grew. You settle on the seafloor & over time become a rock.</i></p> <p><i>Go to SEDIMENTS & ROCKS</i></p>
<p><i>You are part of digestive gases in a cow. You get burped or farted into the air as methane gas.</i></p> <p><i>Go to ATMOSPHERE</i></p>	<p><i>You part of the shell of a mussel that is cracked open by a sea bird and dropped back into the water. You settle to the seafloor & over time become a rock.</i></p> <p><i>Go to SEDIMENTS & ROCKS</i></p>
<p><i>You are part of an lioness that is hurt during a hunt. You get an infection and die of disease.</i></p> <p><i>Go to LITTER & WASTE</i></p>	<p><i>You are an elephant that has lived for many years. You succumb to old age and die.</i></p> <p><i>Go to LITTER & WASTE</i></p>

Animal

Animal

Animal

Animal

Animal

Animal

Animal

Animal

<p><i>You are part of an Antelopes heart. You are hunted & eaten for dinner by a pack of wolves.</i></p> <p><i>Go to ANIMAL</i></p>	<p><i>You are cellulose in a plant that cannot be digested by the animal, you are eliminated.</i></p> <p><i>Go to LITTER & WASTE</i></p>
<p><i>You are part of a tuna in the ocean. You are eaten by a shark for lunch.</i></p> <p><i>Go to ANIMAL</i></p>	<p><i>You are part of the development of a baby goat.</i></p> <p><i>Go to ANIMAL</i></p>
<p><i>You are part of a mouse. You are hunted and eaten by the family cat after he plays with you a bit.</i></p> <p><i>Go to ANIMAL</i></p>	<p><i>You are part of a deer that was shot with an arrow but got away. You die of your injuries.</i></p> <p><i>Go to LITTER & WASTE</i></p>
<p><i>You are part of digestive gases in an Elk. You are burped or farted into the air as methane gas.</i></p> <p><i>Go to ATMOSPHERE</i></p>	<p><i>You are a salmon swimming upriver to spawn when you are plucked from the water by an Eagle for dinner.</i></p> <p><i>Go to ANIMAL</i></p>

Animal

Animal

Animal

Animal

Animal

Animal

Animal

Animal

You are used in a chemical process used by marine organisms to build and strengthen their shells.

Go to ANIMAL

You are used in a chemical process used by marine organisms to build and strengthen their shells.

Go to ANIMAL

You are used in a chemical process that creates calcium carbonate which stays in the water.

Stay Put!

You are used in a chemical process that creates calcium carbonate which stays in the water.

Stay Put!

You are part of a marine organism that has died and is decaying in deep water. You are released into the water.

Stay Put!

You are part of a marine organism that has died and is decaying in deep water. You are released into the water.

Stay Put!

You are part of the litter of shells & bones that has settled on the seafloor. Over time you become a rock.

Go to SEDIMENTS & ROCK

You are part of the litter of shells & bones that has settled on the seafloor. Over time you become a rock.

Go to SEDIMENTS & ROCK

Water

Water

Water

Water

Water

Water

Water

Water















